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SHORT REPORT

A Penetrating Inferior Vena Caval Filter…

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Introduction. *The concept of vena caval interruption was first described by Armand Trousseau in 1865 [HANN CL. STREIFF MB. The role of vena caval filters in the management of venous thromboembolism.* Blood Rev *2005;19(4):179–202]. Methods described have included surgical ligation of the inferior vena cava (IVC) to the development of percutaneous inferior vena caval filters which have been, up until recently, permanently placed in the vessel.*

These devices are not without risk. We describe a case of penetration of the duodenum by a standard stainless steel Greenfield vena caval filter.

Report. *An 83 year old woman presented with vague epigastric discomfort. She was noted to have intermittent globally deranged liver function tests and was investigated accordingly. Investigations included an endoscopic retrograde cholangiopancreaticography (ERCP) which revealed an inferior vena cava filter penetrating the wall of the small bowel.*

Conclusion. *We describe this unique presentation of a penetrating vena caval filter and suggest that a clinician may be inclined to consider a simple endoscopy on occasions when this complication/diagnosis is considered.*

Keywords: Vena caval interruption; Inferior vena caval filter; Permanent venacaval filter; Removable vena caval filter; Penetrating filter.

Introduction

The concept of vena caval interruption was first described by Armand Trousseau in 1865. The first inferior venacaval filter was produced in 1967. There now is a range of permanent and removable inferior venacaval filters. Vena-caval filters are not without their risks. We describe a case of penetration of the duodenum by a standard stainless steel Greenfield vena caval filter.

Report

An 83 year old woman presented with vague epigastric discomfort. She was noted to have global derangements in her liver function tests (Gamma Glutamic Transpeptidase (GGT) = 640, Aminotransferase(ALT) = 95, aspartate aminotransferase(AST) = 197 and Bilirubin = 28) which subsequently normalized spontaneously in 48 hours. The amylase and lipase were within normal range throughout the admission. She was also noted to have an elevated white cell count and low grade temperatures that settled with antibiotic therapy. She went on to have an ultrasound scan which confirmed the previous cholecystectomy along with evidence of a dilated common bile duct and hepatic duct. A fine cut CT scan was undertaken and the findings were in keeping with the ultrasound scan, with the identification of an inferior vena caval filter at the level of the second part of the duodenum (Fig. 1). The standard stainless steel Green-field ven caval filter had been placed 6 years earlier because of recurrent DVT complicated by pulmonary emboli. The filter was placed because haematuria and epistaxis resulting from poorly managed warfarin therapy. She also had suffered a cerebro-vascular accident which was a further contraindication to anti-coagulation. An endoscopic retrograde cholangio-pancreaticography was subsequently undertaken and revealed what seemed to be a portion of the caval filter protruding into the second part of the duodenum (Fig. 2). The remainder of the study was normal. No attempt was made to extract the device at the time of the procedure.

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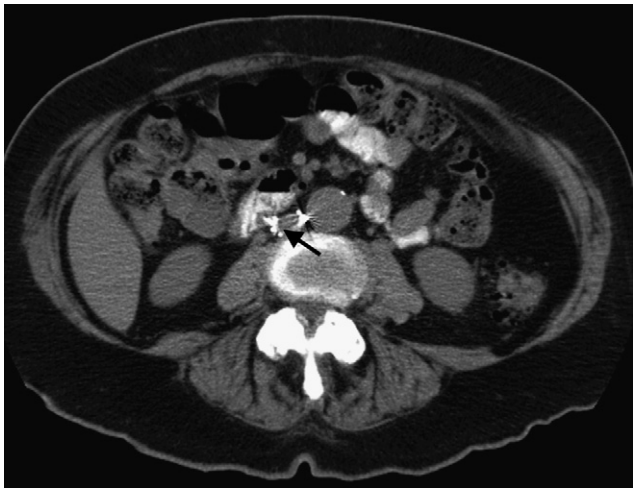

Fig. 1. The IVC filter viewed at CT.

The decision was made, in conjunction with the vascular surgeons, to manage her conservatively as she was deemed to be a high anaesthetic risk given her age and co-morbidities, which included ischemic heart disease and congestive cardiac failure.

It was hypothesized that she was septic at the time of presentation from the caval filter erosion into bowel. She was placed on long term antibiotics and discharged. She remained stable for 1 month after discharge. She had limited epigastric discomfort which she described as ''tolerable'' and was systemically well with good oral intake.

Discussion

It is difficult to be certain about which vena caval filter would have been best suited for our patient or how we could have reduced the chance of complications.

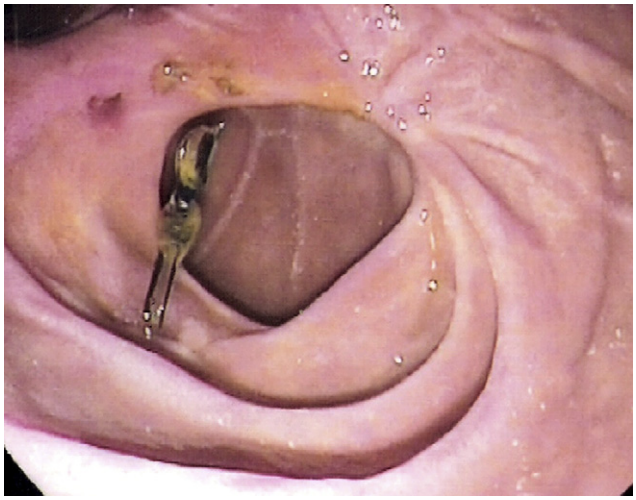

Fig. 2. The penetrating IVC filter at ERCP.

Permanent vena-caval filters have been shown to be effective but there are concerns with recurrent thrombosis and embolisation along with filter migration and fracture.[1,2] In addition, often patients require filters for only temporary indications as is the case of contraindication to anticoagulation with the view to undertaking a procedure or for only a period of increased risk, as in trauma or pregnant patients.

Decousus etal revealed that permanent vena caval filters were effective in lowering the incidences of pulmonary embolus in patients during the early phase of their study, however the incidence of recurrent deep venous thrombosis was higher than the non-filter group and there was no difference in the rate of pulmonary emboli between the two groups by the end of 2 years.[3]

Removable vena caval filters may be more suitable, particularly in situations where there is a transient need for vena caval interruption. However there has been little evaluation of vena caval filters with recommendations for prospective randomized trials to assess the various filters available.[1,4,5] There is concern about infection caused by filter removal and further thrombo-embolic risks after removal of the device.[5]

With specific reference to the complication we experienced, penetration is described as occurring when the filter component traverses the inferior vena caval wall and enters the peri-caval space. Limited penetration of the vessel wall however is desired and required to anchor the filter in position.[1] It has been noted that the stainless steel Greenfield filter has sharper hooks than the newer modified titanium variety, which may result in excessive penetration.

Penetration of the caval wall by the standard stainless steel Greenfield filter has been reported as being infrequent.[4] Filter components penetrating adjacent structures and producing clinical consequences have been reported as occurring in 0.3% of cases.[1] Complication rates quoted are limited however by studies containing too few patients or those in which a significant number of patients are lost to follow up.[3] Complications have included small bowel obstruction, duodenal perforation and retroperitoneal bleeding, which can include pseudo-aneurysm formation. Patients have been noted to present in different ways with caval filter penetration, including epigastric pain with nausea and vomiting, diarrhoea with night sweats and weight loss and abdominal distention with pyrexia.[1]

With our patient the transient derangement in the liver function tests might be attributed to the septic

state of the patient or possibly from oedema or swelling of the ampulla as a result of local inflammation and infection from the penetrating caval filter. The epigastric pain, elevated white cell count and febrile state were associated with both sepsis and local pathology.

This case demonstrates that clinician should consider a simple endoscopy on occasions when filter penetration is considered, even if clinical assessment or imaging does not confirm vena caval penetration.

There may be a role for regular follow up of patients with caval filters, looking for adverse complications, although the newer modified titanium Greenfield filters are likely to have a lower complication rate.

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